

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 10/653,350

Confirmation No.: 3503

Applicant : Eun Jung Lee

Filed : September 2, 2003

TC/A.U. : 1647

Examiner : Seharaseyon, Jegatheesan

Docket No. : 027707.00017

Customer No. : 38485

For : GLYCOSYLATED HUMAN INTERFERON ALPHA ISOFORM

AMENDMENT AFTER NOTICE OF ALLOWANCE
IN ACCORDANCE WITH 37 C.F.R. 1.312

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This post allowance communication is submitted in response to the Notice of Allowance dated August 8, 2007.

A Response was filed on May 15, 2007 in response to the Office Action mailed on November 15, 2006 for the above-referenced patent application.

At the time of filing the response (May 15, 2007), a replacement figure was submitted for figure 8. I have attached for your convenience a copy of the Response as filed, along with a copy of the USPTO stamped return receipt postcard.

Applicant received the Notice of Allowance dated August 8, 2007 in which we noted that acknowledgment of the replacement figure 8 was not made.

I hereby certify that this correspondence is being deposited in the U.S. Patent and Trademark Office via Electronic Filing to the Commissioner for Patents.

November 6, 2007

Marylee Jenkins, Reg. No. 37,645

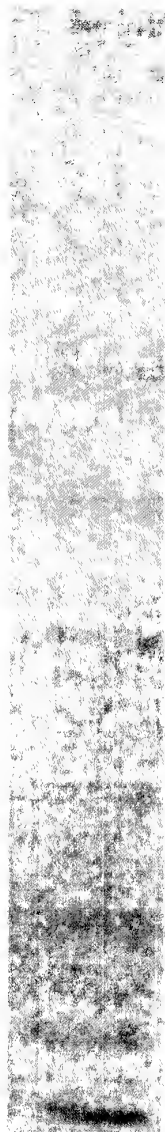
Applicant respectfully requests that the attached replacement figure 8 be considered and accepted for the above-referenced patent application.

Applicant believes that no additional fees are required in connection with this response. However, if additional fees are required, the Commissioner is hereby authorized to charge any additional payment, or credit any overpayment, to Deposit Account No. 01-2300, referencing **Docket Number 027707.00017**.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read 'Marylee Jenkins', is written over a horizontal line.

Marylee Jenkins
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Customer No. 38485



Replacement Figure 8
Application No. 10/653,350
Title: Glycosylated Human Interferon Alpha Isoform
Attorney Docket No.: 027707-00017

Appln. No. 10/653,350
Reply to Office Action of November 15, 2006
Response dated May 15, 2007

COPY

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Applicant. : Eun Jung Lee
Filed : September 2, 2003
TC/A.U. : 1647
Examiner : Seharaseyon, Jegatheesan
Docket No. : 027707.00017
Customer No. : 38485
For : GLYCOSYLATED HUMAN INTERFERON ALPHA ISOFORM

RESPONSE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This paper is submitted in response to the Office Action dated November 15, 2006.

Amendments to the Claims are reflected on page 2 of this paper.

Remarks begin on page 5 of this paper.

I hereby certify that this correspondence is being deposited in the U.S. Patent and Trademark Office via First class mail to the Commissioner for Patents.

Rochelle K. Seide
Rochelle K. Seide, Reg. No. 32,300

May 15, 2007

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Canceled)
2. (Canceled)
3. (Withdrawn) An isolated nucleic acid encoding the recombinant human interferon alpha isoform of claim 1.
4. (Withdrawn) The isolated nucleic acid according to claim 3, wherein the encoded recombinant human interferon alpha isoform comprises the amino acid sequence of SEQ ID NO:1 modified to contain at least one N-glycosylation motif with the sequence Asn-Xaa-Ser/Thr such that the asparagine residue of the motif occurs at a site selected from the group consisting of Cys1, Asp2, Pro4, Gln5, Thr6, His7, Ser8, Arg22, Arg23, Ile24, Ser25, Leu26, Phe27, Ser28, Cys29, Leu30, Lys31, Asp32, Arg33, His34, Asp35, Phe36, Gly37, Pro39, Gln40, Glu41, Glu42, Phe43, Gly44, Asn45, Gln46, Phe47, Gln48, Lys49, Ala50, Glu51, Thr52, Ser68, Asp77, Lys134, Tyr135, Ser136, Gln158, Glu159, Ser160, Leu161, Arg162, Ser163, Lys164, and Glu165.
5. (Withdrawn) An expression vector comprising the nucleic acid of claim 3.
6. (Canceled)
7. (Canceled)

8. (Canceled)
9. (Canceled)
10. (Withdrawn) A method for producing an N-glycosylated human interferon alpha isoform comprising:

culturing a eukaryotic host cell transformed or transfected with the expression vector of claim 8 under conditions that permit expression of the encoded recombinant human interferon alpha isoform; and

isolating the expressed recombinant human interferon alpha isoform from the culture.
11. (New) A recombinant human interferon alpha isoform comprising the amino acid sequence of SEQ ID NO: 1 that has been modified such that His 34 has been replaced by Asn and Phe 36 has been replaced by Ser.
12. (New) A recombinant human interferon alpha isoform comprising the amino acid sequence of SEQ ID NO: 1 that has been modified such that His 34 has been replaced by Asn, Phe 36 has been replaced by Ser and Leu 26 has been replaced by Asn.
13. (New) A recombinant human interferon alpha isoform comprising the amino acid Sequence of SEQ ID NO: 1 that has been modified such that His 34 has been replaced by Asn, Phe 36 has been replaced by Ser and Lys 134 has been replaced by Asn.

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14 (New) A recombinant human interferon alpha isoform having the sequence of SEQ ID NO: 1 that has been modified such that His 34 has been replaced by Asn, Phe 36 has been replaced by Ser, Leu 26 has been replaced by Asn and Lys 134 has been replaced by Asn.

15. (New) A pharmaceutical composition comprising the recombinant human interferon alpha isoform according to any one of claims 11 to 14 and a pharmaceutically acceptable carrier.

REMARKS

This is in response to the Office Action mailed November 15, 2006 in the above-identified application. A three-month extension of time for response is requested and the required fee is enclosed.

The present application is directed to glycosylated human interferon alpha isoforms having increased stability in vivo.

Claims 1, 2, and 6-9 are pending and under examination. Claims 3-5 and 10 are withdrawn from consideration.

By this amendment, Claims 1, 2 and 6-9 have been canceled and Claims 11-15 have been added to more particularly define the present invention. Claims 11-15 are supported by the specification, inter alia, at paragraphs 44, 50, 53, 80 and 106-120. Thus, the amendments do not constitute new matter.

The Examiner has objected to Figure 8 as being unclear and providing no useful information. A replacement Figure 8 is enclosed which, applicants submit, should overcome the objection.

Claims 1, 2, 6, 7 and 9 have been rejected. These claims have been canceled and replaced by new Claims 12-15.

Claim 8 has been objected but deemed allowable if rewritten in independent form. Claim 8 has been replaced by new Claim 11 which should be allowable.

Claims 1 and 2 have been rejected under 35 USC §112 ¶1 as lacking enablement for the full scope of the claims. Claims 1 and 2 have been canceled, and replaced by Claims 11-15.

Applicants maintain that new Claims 11-15 are fully enabled by the specification. Claims 11-15 define human interferon alpha isoforms having the amino acid sequence of SEQ ID NO: 1 (admittedly enabled by the Examiner in the Office Action) in which certain defined amino acid substitutions have been made to provide increased in vivo stability. Claim 11 has essentially the same scope as original Claim 8 which the Examiner has deemed allowable.

The modifications in SEQ ID NO: 1 in each of the claims is as follows:

Claim 11	His 34 → Asn; Phe 36 → Ser
Claim 12	His 34 → Asn; Phe 36 → Ser; Leu 26 → Asn
Claim 13	His 34 → Asn; Phe 36 → Ser; Lys 134 → Asn
Claim 14	His 34 → Asn; Phe 36 → Ser; Leu 26 → Asn and Lys 134 → Asn

The specification clearly teaches each of these isoforms and their preparation (e.g. paragraphs 106-120) as well as showing they have increased stability (e.g. Figures 8 and 9). In view of the amendments herein, Applicants maintain that the rejection of Claims 1 and 2 as lacking enablement is obviated and that the isoforms defined by Claims 11-15 are clearly enabled and, thus, allowable.

Claims 1 and 2 have been rejected as lacking an adequate written description. The Examiner has alleged that applicants did not have possession of the claimed subject matter at the time of filing.

In view of the amendments to the claims, Applicants maintain that they are clearly in possession of the presently claimed invention. The interferon alpha isoforms of Claims 11-15 are clearly described in the present application in a way showing that the

inventors had possession of the claimed subject matter. Applicants, thereby, request that the lack of adequate written description rejection be withdrawn.

Claims 1 and 2 have been rejected under 35 USC §103(a) as obvious over Nyman et al. in view of U.S. Patent No. 6,309,118 to Margolin et al.

Nyman teaches an interferon alpha isoform (IFN - α - 14c) that has a glycosylation site at Asn 72. Margolin et al. teach carbohydrate moieties attached to glycoproteins through the hydroxyl side chains of threonine and serine or through the amide nitrogen side chain of asparagine. Margolin et al. also teaches that the addition of such carbohydrate moieties help to increase the stability of the protein.

However, the combination of Nyman and Margolin neither teaches nor suggests the presently claimed interferon alpha isoforms. Indeed, the Examiner indicates that original Claim 8 which corresponds to present Claim 11 is patentable. In view of the amendments to the claims, Applicants maintain that the obviousness rejection of Claims 1 and 2 over Nyman in view of Margolin has been obviated and that Claims 11-15 are allowable.

Claims 6, 7 and 9 have been rejected as obvious over Goeddel et al. (U.S. Pat. No. 6,482,613) in view of Sekellick et al. (U.S. Pat. No. 6,020,465) and Apweiler et al.

Goeddel provides a recombinant human interferon alpha isoform in *E. coli*: (which would not be glycosylated). The glycosylation motif "NXS/T" is not provided. Apweiler provides the glycosylation motif NXS/T (where X is any amino acid except Proline) required for glycosylation of a protein. Sekellick teaches that glycosylated proteins may be recombinantly produced in CHO cells and that N-glycosylation increases stability.

Applicants maintain, however, that the combination of these references neither teach nor suggest the presently claimed interferon alpha isoforms (as already acknowledged by the Examiner in indicating that original Claim 8 constituted allowable subject matter). In view of the present amendments, Applicants assert that the obviousness rejection over the combination of Goeddel, Apweiler and Sekellick has been obviated and that Claims 11-15 should be allowed.

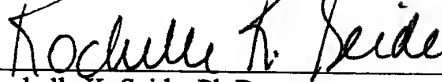
Applicants maintain that, in view of the amendments and remarks herein, Claims 11-15 constitute allowable subject matter. A Notice of Allowance is respectfully requested.

This paper is submitted in response to the Office Action dated November 15, 2006.

A three-month extension of time for response is respectfully requested. Payment of the extension fee is to be made by Credit Card. Applicants believe that no additional fees are required in connection with this response. However, if additional fees are required, the Commissioner is hereby authorized to charge any additional payment, or credit any overpayment, to Deposit Account No. 01-2300, **referencing Docket Number 027707.00017.**

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Respectfully submitted,

A handwritten signature in cursive script, reading "Rochelle K. Seide". The signature is written in dark ink and is positioned above a horizontal line.

Rochelle K. Seide, Ph.D.
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Fax No. (212) 484-3990
Customer No. 38485

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FEE CALCULATION

Any additional fee required has been calculated as follows:

 If checked, "Small Entity" status is claimed.

	(Column 1)	(Column 2)	(Column 3)	SMALL ENTITY			LARGE ENTITY	
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NO. PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADD'L FEE	OR	RATE	ADD'L FEE
TOTAL CLAIMS	6 MINUS	20	= 0	x \$25	\$		x \$50	\$0.00
INDEP CLAIMS	2 MINUS	3	= 0	x \$100	\$		x \$200	\$0.00
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEP. CLAIM				+ \$180	\$	OR	+ \$360	\$0.00
					\$			\$0.00

The U.S. Patent and Trademark Office is hereby authorized to charge and deficiency or credit any overpayment of fees associated with this communication to Deposit Account No. 01-2300 referencing docket number 027707.00017.

PETITION FOR EXTENTION OF TIME UNDER 37 CFR 1.136(a)		Docket Number (Optional) 027707.00017
Application Number 10/653,350	Filed September 2, 2003	
GLYCOSYLATED HUMAN INTERFERON ALPHA ISOFORM		
Art Unit 1647	Examiner Seharaseyon, Jegatheesan	

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application. The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	<u>Large Entity Fee</u>	<u>Small Entity Fee</u>	
<input type="checkbox"/> One month (37 CFR 1.17(a)(1))	\$120	\$60	\$ _____
<input type="checkbox"/> Two months (37 CFR 1.17(a)(2))	\$450	\$225	\$ _____
<input checked="" type="checkbox"/> Three months (37 CFR 1.17(a)(3))	\$1020	\$510	\$ 1020
<input type="checkbox"/> Four months (37 CFR 1.17(a)(4))	\$1590	\$795	\$ _____
<input type="checkbox"/> Five months (37 CFR 1.17(a)(5))	\$2160	\$1080	\$ _____

☐ Applicant claims small entity status. See 37 CFR 1.27.
☐ A check in the amount of the fee is enclosed.
☒ Payment by credit card.
☐ The Director has already been authorized to charge fees in this application to a Deposit Account.
☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number **01-2300 (Referencing Docket No. 027707.00017)**. I have enclosed a duplicate copy of this sheet.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the ☐ applicant/inventor.
☐ assignee of record of the entire interest. See 37 CFR 3.71.
 Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).
☒ attorney or agent of record. Registration Number **32,300**
☐ attorney or agent under 37 CFR 1.34
 Registration number if acting under 37 CFR 1.27 _____

Rochelle K. Seide

Signature

Rochelle K. Seide, Ph.D.

Typed or printed name

May 15, 2007

Date

(212) 484-3945

Telephone Number

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☐ Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.36(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450. If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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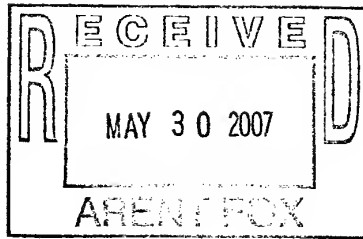
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Patent ☒ Trademark ☐ Docket No. 027707.01017
Serial No. 10/653,350 Filed September 2, 2003
Applicant(s) Eun Jung Lee
Papers filed herewith on May 15, 2007
☐ Fees \$ Ck #
☐ New Application
☒ Amendment
☐ Notice of Appeal
☐ IDS/PTO-SB08
☒ Other 3-month extension of time for \$1020; PTO-2038 Credit Card Form
☐ Assignment (w/PTO-1595 Form)
☐ Declaration
☐ Priority Document
☒ Req. for Ext. of Time
☒ Drawing(s) Replacement Figure 8

(Circular stamp: MAY 18 2007)

Receipt is hereby acknowledged of the papers filed as indicated in connection with the above-identified case.

COMMISSIONER OF PATENTS

FILE NO. 027707.00017
status due: Nov. 15, 2007
FINAL:
ENTERED BY: San
ATTY: AKS

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Patent ☒ Trademark ☐ Docket No. 027707.06017

Serial No. 10/653,350 Filed September 2, 2003

Applicant(s) Eun Jung Lee

Papers filed herewith on May 15, 2007

- | | |
|--|---|
| <input type="checkbox"/> Fees \$ <u> </u> Ck # <u> </u> | <input type="checkbox"/> Assignment (w/PTO-1595 Form) |
| <input type="checkbox"/> New Application | <input type="checkbox"/> Declaration |
| <input checked="" type="checkbox"/> Amendment | <input type="checkbox"/> Priority Document |
| <input type="checkbox"/> Notice of Appeal | <input checked="" type="checkbox"/> Req. for Ext. of Time |
| <input type="checkbox"/> IDS/PTO-SB08 | <input checked="" type="checkbox"/> Drawing(s) Replacement Figure 8 |
| <input checked="" type="checkbox"/> Other <u>3-month extension of time for \$1020; PTO-2038 Credit Card Form</u> | |

Receipt is hereby acknowledged of the papers filed as indicated in connection with the above-identified case.

COMMISSIONER OF PATENTS